

WHAT IS CLAIMED IS:

- 1 1. A pluripotent embryonic-like stem cell, derived from non-embryonic or postnatal
2 animal cells or tissue, capable of self-renewal and capable of differentiation to cells of
3 endodermal, ectodermal and mesodermal lineages.
- 1 2. The stem cell of Claim 1 which is a human cell.
- 1 3. The stem cell of Claim 1 which is isolated from the non-embryonic tissue selected
2 from the group of muscle, dermis, fat, tendon, ligament, perichondrium, periosteum,
3 heart, aorta, endocardium, myocardium, epicardium, large arteries and veins,
4 granulation tissue, peripheral nerves, peripheral ganglia, spinal cord, dura,
5 leptomeninges, trachea, esophagus, marrow, stomach, small intestine, large intestine,
6 liver, spleen, pancreas, parietal peritoneum, visceral peritoneum, parietal pleura,
7 visceral pleura, urinary bladder, gall bladder, kidney, associated connective tissues or
8 bone marrow.
- 1 4. A pluripotent endodermal stem cell derived from the stem cell of Claim 1.
- 1 5. A pluripotent mesenchymal stem cell derived from the stem cell of Claim 1.
- 1 6. A pluripotent ectodermal stem cell derived from the stem cell of Claim 1.
- 1 7. A endodermal, ectodermal or mesodermal lineage-committed cell derived from the
2 stem cell of Claim 1.
- 1 8. A culture comprising:
2 (a) Pluripotent embryonic-like stem cells, derived from postnatal animal cells or
3 tissue, capable of self-renewal and capable of differentiation to cells of endodermal,
4 ectodermal and mesodermal lineages; and
5 (b) a medium capable of supporting the proliferation of said stem cells.

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1 9. The culture of Claim 8, further comprising a proliferation factor or lineage
2 commitment factor.

1 10. The culture of Claim 8 wherein said stem cells are human cells.

1 11. A method of isolating an pluripotent embryonic-like stem cell, comprising the
2 steps of:

- 3 (a) obtaining cells from a postnatal animal source;
- 4 (b) slow freezing said cells in medium containing 7.5% (v/v) dimethyl sulfoxide
- 5 until a final temperature of -80° C is reached; and
- 6 (c) culturing the cells.

1 12. A method of isolating a clonal pluripotent embryonic-like stem cell line,
2 comprising the steps of:

- 3 (a) obtaining cells from a postnatal animal source;
- 4 (b) slow freezing said cells in medium containing 7.5% (v/v) dimethyl sulfoxide
- 5 until a final temperature of -80° C is reached;
- 6 (c) culturing the cells;
- 7 (d) diluting said cultured cells to clonal density;
- 8 (e) culturing said diluted cells;
- 9 (e) propogating those cultures having a single cell.

1 13. A clonal pluripotent embryonic-like stem cell line developed by the method of
2 Claim 12.

1 14. The stem cell of Claim 1 genetically engineered to express a gene or protein of
2 interest.

1 15. A method of producing a genetically engineered pluripotent embryonic-
2 likestem cell comprising the steps of:

- 3 (a) transfecting pluripotent embryonic-like stem cells with a DNA construct
- 4 comprising at least one of a marker gene or a gene of interest;

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- 5 (b) selecting for expression of the marker gene or gene of interest in the
6 pluripotent embryonic-like stem cells;
7 (c) culturing the stem cells selected in (b).

1 16. A genetically engineered pluripotent embryonic-like stem cell produced by the
2 method of Claim 15.

1 17. The stem cell of Claim 16 which is a human cell.

1 18. A method for detecting the presence or activity of an agent which is a lineage-
2 commitment factor comprising the steps of:

3 A. contacting the stem cells of Claim 1 with a sample suspected of containing an
4 agent which is a lineage-commitment factor; and

5 B. determining the lineage of the so contacted cells by mRNA expression, antigen
6 expression or other means;

7 wherein the lineage of the contacted cells indicates the presence or activity of a
8 lineage-commitment factor in said sample.

1 19. A method of testing the ability of an agent, compound or factor to modulate
2 the lineage-commitment of a lineage uncommitted cell which comprises

3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the
4 stem cells as lineage uncommitted cells;

5 B. adding the agent, compound or factor under test; and

6 C. determining the lineage of the so contacted cells by mRNA expression, antigen
7 expression or other means.

1 20. An assay system for screening agents, compounds or factors for the ability to
2 modulate the lineage-commitment of a lineage uncommitted cell, comprising:

3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the
4 stem cells as lineage uncommitted cells;

5 B. adding the agent, compound or factor under test; and

6 C. determining the lineage of the so contacted cells by mRNA expression, antigen
7 expression or other means.

1 21. A method for detecting the presence or activity of an agent which is a
2 proliferation factor comprising the steps of:
3 A. contacting the stem cells of Claim 1 with a sample suspected of containing
4 an agent which is a proliferation factor; and
5 B. determining the proliferation and lineage of the so contacted cells by
6 mRNA expression, antigen expression or other means;
7 wherein the proliferation of the contacted cells without lineage commitment
8 indicates the presence or activity of a proliferation factor in said sample.

1 22. A method of testing the ability of an agent, compound or factor to modulate
2 the proliferation of a lineage uncommitted cell which comprises
3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the
4 stem cells as lineage uncommitted cells;
5 B. adding the agent, compound or factor under test; and
6 C. determining the proliferation and lineage of the so contacted cells by mRNA
7 expression, antigen expression or other means.

1 23. An assay system for screening agents, compounds or factors for the ability to
2 modulate the proliferation of a lineage uncommitted cell, comprising:
3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the
4 stem cells as lineage uncommitted cells;
5 B. adding the agent, compound or factor under test; and
6 C. determining the proliferation and lineage of the so contacted cells by mRNA
7 expression, antigen expression or other means.

1 24. A method of transplanting pluripotent embryonic-like stem cells in a host
2 comprising the step of introducing into the host the stem cells of Claim 1.

1 25. A method of providing a host with purified pluripotent embryonic-like stem
2 cells comprising the step of introducing into the host the pluripotent embryonic-like
3 stem cells of Claim 1.

- 1 26. A method of *in vivo* administration of a protein or gene of interest comprising
2 the step of transfecting the pluripotent embryonic-like stem cell of Claim 1 with a
3 vector comprising DNA or RNA which expresses a protein or gene of interest.
- 1 27. A method of preventing and/or treating cellular debilitations, derangements
2 and/or dysfunctions and/or other disease states in mammals, comprising administering
3 to a mammal a therapeutically effective amount of pluripotent embryonic-like stem
4 cells, or cells or tissues derived therefrom.
- 1 28. A method of tissue repair or transplantation in mammals, comprising
2 administering to a mammal a therapeutically effective amount of pluripotent
3 embryonic-like stem cells, or cells or tissues derived therefrom.
- 1 29. A method of preventing and/or treating cellular debilitations, derangements
2 and/or dysfunctions and/or other disease states in mammals, comprising administering
3 to a mammal a therapeutically effective amount of a endodermal, ectodermal or
4 mesodermal lineage-committed cell derived from the stem cell of Claim 1.
- 1 30. A method of tissue repair or transplantation in mammals, comprising
2 administering to a mammal a therapeutically effective amount of a endodermal,
3 ectodermal or mesodermal lineage-committed cell derived from the stem cell of
4 Claim 1.
- 1 31. A pharmaceutical composition for the treatment of cellular debilitation,
2 derangement and/or dysfunction in mammals, comprising:
3 A. a therapeutically effective amount of pluripotent embryonic-like stem cells,
4 or cells or tissues derived therefrom; and
5 B. a pharmaceutically acceptable medium or carrier.
- 1 32. The pharmaceutical composition of Claim 28 further comprising a proliferation
2 factor or lineage-commitment factor.